

# Trends in Race/Ethnicity of Pediatric Residents and Fellows: 2007–2019

Kimberly Montez, MD, MPH,<sup>a</sup> Emma A. Omoruyi, MD, MPH,<sup>b</sup> Kenya McNeal-Trice, MD,<sup>c</sup> Wendy J. Mack, PhD,<sup>d</sup> Lahia Yemane, MD,<sup>e</sup> Alissa R. Darden, MD,<sup>f</sup> Christopher J. Russell, MD, MS<sup>g,h</sup>

## abstract

**BACKGROUND AND OBJECTIVES:** A diverse pediatric workforce reflecting the racial/ethnic representation of the US population is an important factor in eliminating health inequities. Studies reveal minimal improvements over time in the proportions of underrepresented in medicine (URiM) physicians; however, studies assessing trends in pediatric URiM trainee representation are limited. Our objective was to evaluate longitudinal trends in racial/ethnic representation among a cross-section of US pediatric trainees and to compare it to the US population.

**METHODS:** Repeated cross-sectional study of graduate medical education census data on self-reported race/ethnicity of pediatric residents and subspecialty fellows from 2007 to 2019. To evaluate trends in URiM proportions over time, the Cochran-Armitage test was performed. Data on self-reported race/ethnicity of trainees were compared with the general population data over time by using US Census Bureau data.

**RESULTS:** Trends in URiM proportions were unchanged in residents (16% in 2007 to 16.5% in 2019;  $P = .98$ ) and, overall, decreased for fellows (14.2% in 2007 to 13.5% in 2019;  $P = .002$ ). URiM fellow trends significantly decreased over time in neonatal-perinatal medicine ( $P < .001$ ), infectious diseases ( $P < .001$ ), and critical care ( $P = .006$ ) but significantly increased in endocrinology ( $P = .002$ ) and pulmonology ( $P = .009$ ). Over time, the percentage of URiM pediatric trainee representation was considerably lower compared to the US population.

**CONCLUSIONS:** The continued underrepresentation of URiM pediatric trainees may perpetuate persistent health inequities for minority pediatric populations. There is a critical need to recruit and retain pediatric URiM residents and subspecialty fellows.



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<sup>a</sup>Department of Pediatrics, Wake Forest Baptist Medical Center and Wake Forest University, Winston-Salem, North Carolina; <sup>b</sup>Department of Pediatrics, John P. and Kathrine G. McGovern Medical School, University of Texas Health Science Center at Houston, Houston, Texas; <sup>c</sup>Department of Pediatrics, School of Medicine, The University of North Carolina at Chapel Hill, Chapel Hill, North Carolina; <sup>d</sup>Departments of Preventive Medicine and <sup>e</sup>Pediatrics, Keck School of Medicine, University of Southern California, Los Angeles, California; <sup>f</sup>Division of General Pediatrics, Department of Pediatrics, School of Medicine, Stanford University, Palo Alto, California; <sup>g</sup>Department of Child Health, College of Medicine–Phoenix, University of Arizona, Phoenix, Arizona; and <sup>h</sup>Division of Hospital Medicine, Children's Hospital Los Angeles, Los Angeles, California

Dr Montez conceptualized and designed the study, performed data extraction, drafted the initial manuscript, and reviewed and revised the manuscript; Drs Omoruyi and McNeal-Trice conceptualized and designed the study, drafted portions of the manuscript, and reviewed and revised the manuscript; Drs Yemane and Darden conceptualized and designed the study and reviewed and revised the manuscript; Dr Mack conducted the analysis and reviewed and revised the manuscript; Dr Russell conceptualized and designed the study, supervised data extraction, and critically reviewed the manuscript for important intellectual content; the first, fourth, and senior authors had full access to all the data in the study and take responsibility for the integrity of the data and the accuracy of the data analysis; and all authors approved the final manuscript as submitted and agree to be accountable for all aspects of the work.

**WHAT'S KNOWN ON THIS SUBJECT:** Cultivating a pediatric workforce could address child health racial/ethnic inequities. Studies reveal minimal to modest improvements over time in the proportions of underrepresented in medicine (URiM) physicians; however, studies assessing proportions of URiM pediatric trainee trends are limited.

**WHAT THIS STUDY ADDS:** Using publicly available cross-sectional data from 2007 to 2019, we found that trends in URiM proportions were unchanged in residents and overall decreased for fellows. Over time, the percentage of URiM pediatric trainee representation was considerably lower compared with US population representation.

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Racial and ethnic minority children experience persistent, pervasive health disparities relative to white children.<sup>1</sup> A diverse pediatric medical workforce is an important factor in eliminating health inequities experienced by children in the United States, particularly for an increasingly diverse population. By 2060, the racial and ethnic composition of US children is projected to be just more than one-third non-Hispanic white, yet 54.7% of practicing pediatricians identify as such.<sup>2–4</sup> Cultivating a pediatric workforce that is representative of the population could help address the racial and ethnic inequities in the health and health care of children. For example, racial concordance, in which the provider and patient share the same racial identity, is associated with reduced infant mortality among Black infants.<sup>5</sup> Multiple studies reveal that physician-patient racial concordance improves patient satisfaction, patient-provider communication, and medication adherence.<sup>6–9</sup> Additionally, physicians from racial and ethnic minority backgrounds are more likely to care for underserved populations, including pediatricians, which may address inequities in health care access.<sup>10–13</sup> Furthermore, a more diverse medical profession may promote health equity through engagement of diverse study participant populations and by enhancing the research agenda.<sup>1,14,15</sup>

Several professional organizations and governing bodies have called for building a more diverse medical workforce, including the American Academy of Pediatrics, the Association of American Medical Colleges (AAMC), and the Accreditation Council for Graduate Medical Education (ACGME).<sup>16–19</sup> To that end, multiple programs exist along the educational continuum that aim to increase the

representation of underrepresented in medicine (URiM) physicians, including holistic reviews and enrollment management.<sup>20,21</sup> However, URiM representation along the spectrum of the medical profession remains low. For example, disparities in representation exist in the medical admissions process; data from the AAMC from 2018 to 2019 indicate that the racial and ethnic diversity of medical student applicants versus matriculants decreased for African American (AA) or Black students, whereas representation of white and Asian American students increased among matriculants.<sup>22,23</sup> Furthermore, a recent study revealed that, despite modest increases in the proportion of URiM groups, Black, Hispanic, and American Indian (AI) or Alaskan native (AN) students remain underrepresented among matriculating medical students compared with representation of the US population.<sup>24</sup>

Studies across various medical specialties and professional organizations have revealed minimal to modest improvements over time in the proportions of URiM trainees and faculty.<sup>25–28</sup> Among practicing US pediatric physicians, the racial and ethnic diversity in 2018 was 54.7% white, 13.8% Asian, 7.2% Hispanic, 6.2% Black, 0.9% multiracial, 0.6% other, 0.3% AI or AN, 0.1% native Hawaiian (NH) or Pacific Islander (PI), and 16.2% unknown.<sup>3,4</sup> In academic pediatrics, a recent study revealed an increase in the proportion of Academic Pediatrics Association members self-identifying as URiM.<sup>27</sup> However, studies assessing trends in racial and ethnic representation among US pediatricians, and particularly trainees, are limited.

Therefore, our aims with this study are to do the following: (1) evaluate trends over time from 2007 to 2019

in racial and ethnic representation among a cross-section of US pediatric residency and fellowship trainees, and (2) compare racial and ethnic representation between pediatric trainees and the US population.

## METHODS

### Design

We performed a repeated cross-sectional study of race and ethnicity in pediatric residents and subspecialty fellows using publicly available National Graduate Medical Education (GME) Census reports from 2007, when race and ethnicity data were first included, to 2019. We used the AAMC Medical Minority Applicant Registry definition of URiM: self-identification as AA or Black, Hispanic or Latino, AI or AN, or NH or PI.<sup>29</sup> This report follows the Strengthening the Reporting of Observational Studies in Epidemiology reporting guideline for cross-sectional studies. This study was considered exempt from human subjects research by the Wake Forest University Health Sciences Institutional Review Board.

### Data Sources

We manually extracted self-reported race and ethnicity data from 2007 to 2019 for US pediatric residents and fellows from the 17 pediatric subspecialties that were available from GME Census reports. These National GME Census data are reported annually in the *Journal of the American Medical Association*, which confirms the data jointly collected by the AAMC and American Medical Association via surveys to directors of programs accredited by the ACGME.<sup>30–42</sup> Confirmation of status for all active physicians-in-training ranged from 92.5% in 2010 to 97.3% in 2019. Race and ethnicity data from specific institutions were not available. Of note, during the study

period, from 2007 to 2014, the National GME Census asked for race and Hispanic ethnicity in 2 separate questions; after 2014, the National GME Census imported self-designated race and ethnicity from AAMC databases, which included a “multiracial” category, referring to trainees who self-identified as >1 race. Throughout all data source years, a person of Hispanic ethnicity could be of any race. We excluded combined residencies not restricted to pediatric trainees and subspecialties in which a completion of a pediatric residency was not required, such as the pediatric surgical subspecialties. We obtained 2019 US population data from the US Census Bureau.<sup>43</sup> We obtained yearly population distribution of race and ethnicity estimates on the basis of analysis of the American Community Survey, 1-year estimates from 2008 to 2019.<sup>44</sup> The racial and ethnic categories used throughout this article reflect those reported in the original data sources.

### Statistical Analysis

Results were analyzed by using descriptive statistics. Inclusion of racial and ethnic groups into the

URiM category was based on the AAMC definition of URiM. Therefore, the unknown and multiracial race and ethnicity categories were not included in the URiM category. Proportions (URiM out of total) were calculated for each year and specialty; the Clopper-Pearson exact binomial method was used to calculate 95% confidence intervals (CIs). To determine if there was a significant trend in URiM representation over time, proportions (URiM out of total) were compared over time to the Cochran-Armitage test from all years (2007–2019) for pediatric residents and fellows from 15 of the 17 available pediatric subspecialties. The clinical informatics subspecialty, which began reporting fellows in 2015, did not report any URiM fellows over the study period; the transplant hepatology subspecialty, which began reporting fellows in 2009, only reported 7 total URiM fellows; these 2 subspecialties were included in the overall analyses, but URiM trends within the subspecialties were not included in the analysis, given the small sample size. The child abuse subspecialty began reporting fellows in 2012.

Results were considered statistically significant at a 2-tailed *P* value < .05. SAS (version 9.4; SAS Institute, Inc, Cary, NC) was used for all analyses.

## RESULTS

### Study Population Characteristics

A total of 109 344 pediatric residents and 44 420 subspecialty fellows were included in the sample. Overall, the unknown race and ethnicity category accounted for 10% of pediatric residents and 5.2% of subspecialty fellows; the multiracial category (available from 2015 to 2019) accounted for 1.2% of pediatric residents and 4% of subspecialty fellows, or 2% of all trainees.

### Trends in Race and Ethnicity Over Time

Between 2007 and 2019, the annual number of pediatric trainees increased from 7964 to 8950 residents and 2684 to 3966 subspecialty fellows; the annual number of URiM pediatric trainees also increased over time, from 1277 to 1478 residents and 382 to 532 subspecialty fellows (Table 1).

**TABLE 1** Trends in Total and URiM Pediatric Residents and Subspecialty Fellows From 2007 to 2019

	2007			2019			2007–2019 <i>P</i> for Trend
	Total	URiM, %	95% CI	Total	URiM, %	95% CI	
Pediatric residents	7964	16.0	15.2–16.9	8950	16.5	15.8–17.3	.98
All subspecialty fellows	2684	14.2	12.9–15.6	3966	13.4	12.4–14.6	.002
Adolescent medicine	61	23.0	13.1–35.5	86	30.2	20.8–41.1	.13
Child abuse <sup>a</sup>	0	0.0	NA	37	13.5	4.5–28.8	.077
Developmental-behavioral	61	11.5	4.7–22.2	109	17.4	10.8–25.9	.31
Neonatal-perinatal medicine	521	18.8	15.5–22.4	760	14.2	11.8–16.9	<.001
Cardiology	306	8.2	5.4–11.8	436	11.7	8.8–15.1	.67
Critical care medicine	334	13.2	9.7–17.3	504	11.5	8.9–14.6	.006
Emergency medicine	248	12.5	8.7–17.3	408	12.0	9.0–15.6	.25
Endocrinology	201	11.0	7.0–16.1	236	20.3	15.4–26.1	.002
Gastroenterology	187	12.3	8.0–17.9	303	11.6	8.2–15.7	.76
Hematology or oncology	336	14.3	10.7–18.5	491	9.6	7.1–12.5	.093
Infectious diseases	147	23.1	16.6–30.8	180	11.7	7.4–17.3	<.001
Nephrology	99	14.1	7.9–22.6	110	15.5	9.3–23.6	.11
Pulmonology	113	12.4	6.9–19.9	161	18.6	12.9–25.5	.009
Rheumatology	58	13.8	6.2–25.4	98	15.3	8.8–24.0	.24
Sports medicine	12	0.0	0–26.5	25	12.0	2.6–31.2	.52

NA, not applicable.

<sup>a</sup> 2011–2012 = first year reporting.

However, over time, the trend in proportions of URiM trainees was unchanged in pediatric residencies (16% in 2007 [CI: 15.2–16.9] to 16.5% in 2019 [CI: 15.8–17.3];  $P = .98$  for trend from 2007 to 2019) and, overall, decreased for subspecialty fellows (14.2% in 2007 [CI: 12.9–15.6] to 13.5% in 2019 [CI: 12.4–14.6];  $P = .002$  for trend from 2007 to 2019). Significantly decreased trends over time in URiM fellow representation also occurred for neonatal-perinatal medicine ( $P < .001$ ), infectious diseases, ( $P < .001$ ), and critical care ( $P = .006$ ). Significantly increased trends in URiM fellow representation existed in endocrinology ( $P = .002$ ) and pulmonology ( $P = .009$ ).

### US Population Comparison

In 2019, the percentage of URiM pediatric trainee representation was considerably lower in comparison with those groups' representation in the US population: AA or Black, 5.6% vs 13.4%; AI or AN, 0.2% vs 1.3%; NH or PI, 0.1% vs 0.2%; Hispanic or Latino, 9.7% vs 18.3%; multiracial, 2% vs 2.8% (Fig 1).<sup>43</sup> Over time, the proportion of URiM pediatric trainee representation remained considerably lower in comparison

with those groups' representation in the US population (Fig 2).<sup>44</sup>

### DISCUSSION

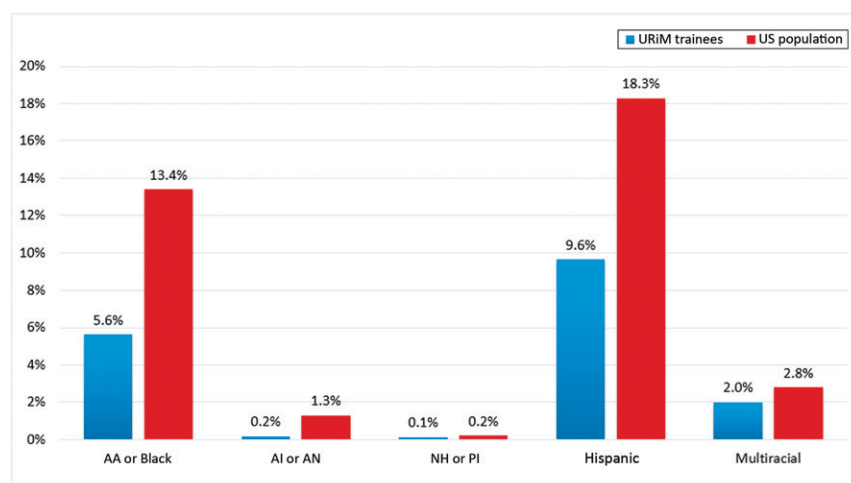
This repeated cross-sectional study of pediatric residents and subspecialty fellows from 2007 to 2019 is one of the first to report trends in URiM pediatric trainee representation. Overall, URiM representation in pediatric training programs remains low. For example, we found that the proportion of URiM representation in residents remained stagnant and significantly declined overall for subspecialty fellows; only the endocrinology and pulmonology subspecialties revealed significant improvement in URiM subspecialty fellow representation over time. In 2019, URiM representation among pediatric trainees did not reflect the racial and ethnic diversity of the US population, which was a consistent pattern over time.

Although further research is needed to delineate the reasons for the striking lack of URiM representation in pediatrics in general and over time, several possibilities exist that span the entire educational continuum. Previous studies have revealed that URiM medical school

applicants and matriculants have lower representation compared with the US population,<sup>24</sup> indicating that the pattern of underrepresentation in medicine develops before medical school application. Contributing factors to low proportions of URiM medical school applicants include educational disparities starting in primary and secondary education, such as underinvestment in public schools,<sup>45</sup> educational resource allocation disparities,<sup>46</sup> and policies promoting racially segregated schools, including “school choice” and linking enrollment with housing segregation patterns.<sup>47</sup>

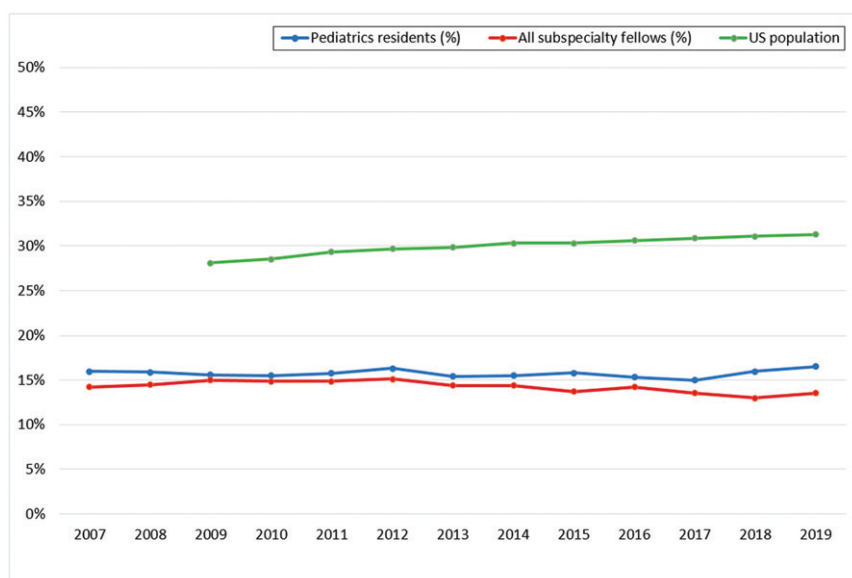
Beyond primary and secondary education, the lack of diversity spans the processes of recruitment, inclusion, and retention, including experiences in the learning and clinical environment, all of which are permeated by racism and bias. For example, in undergraduate education, anti-affirmative action policies have led to sharp declines in the enrollment of underrepresented minorities.<sup>48,49</sup> Public colleges and universities remain inaccessible to Black and Hispanic students,<sup>50</sup> and the percentage of Black men enrolled in medical school decreased between 1978 and 2014 and, since then, has only slightly increased.<sup>51,52</sup> Furthermore, disparities in the proportion of URiM medical school matriculants versus applicants, particularly for Black students, may be due to implicit bias and racism in the admissions process.<sup>53</sup>

Once in medical school, URiM medical students encounter differential access to opportunities, receive lower clinical grades and standardized test scores and fewer inductions into Alpha Omega Alpha honor society, and experience racism and implicit bias in the learning and clinical environments, which lead to higher attrition rates and affect competitiveness as a



**FIGURE 1**

Percentage of URiM trainee representation compared with US population representation, 2019.



**FIGURE 2**

Percentage of URiM pediatric residents and fellows from 2007 to 2019 compared with US population.

residency applicant and pursuit of academic careers.<sup>54–58</sup> These studies highlight that educational disparities for URiM medical students exist even before entering the field of pediatrics. Efforts to increase diversity among pediatric trainees are limited by the amount of URiM graduating medical students, highlighting the need to develop longitudinal diversity initiatives, including mentorship, in the early developmental and educational stages.<sup>59</sup>

In pediatrics, several factors contribute to the lack of diversity in residency, subspecialty fellowship, and academic medicine. For pediatric residencies, URiM medical students report that mentorship and URiM pediatric representation positively influence the choice to pursue academic pediatrics.<sup>60</sup> Additionally, negative experiences in the learning and clinical environment for residents may lead to higher turnover and job satisfaction.<sup>61,62</sup> Studies from other specialty residency programs reveal that URiM residents have higher attrition rates.<sup>63,64</sup> Financial

considerations are frequently cited as a factor when residents consider pediatric subspecialties, with higher debt burdens associated with a push toward general practice.<sup>65,66</sup> It has been revealed that anticipated educational debt can pose a disproportionate barrier for individuals from socioeconomically disadvantaged backgrounds and/or URiM groups,<sup>13,67</sup> likely influencing subspecialty choice and a potential career in academic medicine.<sup>60,68</sup>

Among academic pediatricians, implicit bias may negatively affect minority recruitment efforts from residents to faculty members<sup>68,69</sup> in addition to lack of an explicit URiM recruitment priority by programs.<sup>70</sup> The role of faculty mentors strongly influences choosing a career in academic pediatrics,<sup>65,71</sup> particularly for URiM pediatricians.<sup>68,69</sup> In our study, only the endocrinology and pulmonology subspecialty fellowships significantly increased URiM representation over time, which may reflect mentorship by URiM subspecialists, although further research is necessary to determine race and ethnicity

representation of subspecialty pediatricians. Additionally, the endocrinology and pulmonology fellowships typically have higher percentages of unfilled positions, which may be more likely filled with diverse international medical graduates.

In reference to retention, URiM faculty report less satisfaction with their careers and are more likely to leave academic medicine,<sup>72</sup> creating a vacuum of representation for URiM trainees, including in leadership positions.<sup>68</sup> Given that academic pediatric faculty are involved in career mentoring, advising, and the trainee recruitment process, the racism and implicit bias experienced by URiM faculty in academic medicine may contribute to differential access to URiM mentorship and deter URiM trainees from considering careers in pediatric subspecialties and academic medicine. Lastly, the disparity in numbers of trainees and faculty members from URiM groups is exacerbated among those with intersectional identities.

Intersectionality is often defined as the way social categorizations, including race, ethnicity, class, and gender identity, create overlapping and interdependent systems of discrimination.<sup>73</sup> The majority of practicing pediatricians in the United States identify as women; the AAMC reports that 71% of pediatric residents were women in 2020.<sup>74</sup> In 2018–2019, 41% of full-time faculty identified as women, yet only 13% of those were from a URiM group.<sup>74</sup> Women with intersectional identities are known to experience bias and discrimination at higher rates than other groups,<sup>75</sup> possibly contributing to attrition and lack of representation of URiM women in academic medicine.<sup>76,77</sup>

The AAMC has published a diversity and inclusion strategic planning guide providing a useful framework



to improve the diversity of training programs.<sup>78</sup> Furthermore, in 2019, the ACGME instituted a new common program requirement on diversity:

*The program, in partnership with its Sponsoring Institution, must engage in practices that focus on mission-driven, systematic recruitment and retention of a diverse and inclusive workforce of residents, fellows (if present), faculty members, senior administrative staff members, and other relevant members of its academic community.<sup>19</sup>*

A similar requirement was created by the Liaison Committee on Medical Education in 2009 for medical schools and was last updated in 2015.<sup>18</sup> For recruitment, residency and fellowship training programs should holistically identify potential interviewees and use enrollment management recognizing the success of such programs.<sup>20,21</sup>

Additionally, programs should standardize the interview process and highlight diversity efforts.<sup>20</sup> Barriers should be removed for disadvantaged URiM applicants applying to residency programs, such as application costs and/or scheduling or attending interviews, given the disproportionate debt incurred by URiM applicants.<sup>66,79,80</sup> Pediatric programs should provide ongoing implicit bias training for members of recruitment committees.<sup>81</sup> Furthermore, pediatric training programs can work to mitigate disparities in URiM representation by establishing mentorship programs along the educational spectrum, particularly for medical students.<sup>60</sup> Regular advising meetings with trainees should include discussions on residency, fellowship, and academic faculty preparation and identify gaps in clinical exposure, scholarship, and mentorship. Retention efforts should include examination of the training

environment pertaining to diversity, equity, and inclusion. There should be an annual examination within pediatric programs of recruitment and retention rates of trainees and faculty members, such as a diversity dashboard<sup>82,83</sup>; withdrawals and dismissals among URiM trainees should be analyzed comprehensively. Lastly, professional pediatric societies should also examine the racial and ethnic composition of their members and leadership and take steps to improve recruitment and retention of URiM pediatricians. Beyond pediatrics, rigorous collection of demographic data at a granular level and alignment of this collection across societies and medical institutions may be used to ascertain trends more accurately and assess whether interventions have been successful.

There are some limitations to this study that should be acknowledged. First, National GME Census data are imported from the AAMC's databases, and, when self-reported race and ethnicity were not available, they were reported by the program directors. Second, the change in data collection for the multiracial category may have biased our race and ethnicity results toward observing underrepresentation in URiM groups; however, only 1.2% of residents and 4% of specialty fellows identified as multiracial from 2015 to 2019, and the category may have included individuals who were not URiM.

## CONCLUSIONS

Pediatric residents and subspecialty fellows are the future pediatric workforce. In >10 years, there has been little improvement in the representation of URiM trainees. There is a critical need to recruit and retain URiM pediatric residents

and fellows in all subspecialties to reflect the increasingly diverse populations we serve and to mitigate health inequities. Pediatric residency programs can help alleviate disparities in fellowship programs through early mentorship. Fellowship programs should holistically identify applicants recognizing that higher barriers exist for URiM trainees. Subspecialty societies should identify future subspecialists by creating longitudinal mentorship programs for underrepresented undergraduate and medical students, such as those developed by the Academic Pediatrics Association.<sup>84,85</sup> Professional societies should critically examine the racial and ethnic makeup of their members and leadership. Retention efforts should include an examination of the training environment as it relates to diversity, equity, and inclusion, and dashboards should be created to monitor progress. Standardizing the collection of granular demographic data across societies and institutions may help track recruitment and retention trends, in addition to developing and determining the success of interventions.

## ABBREVIATIONS

AA: African American  
AAMC: Association of American Medical Colleges  
ACGME: Accreditation Council for Graduate Medical Education  
AI: American Indian  
AN: Alaskan native  
CI: confidence interval  
GME: graduate medical education  
NH: native Hawaiian  
PI: Pacific Islander  
URiM: underrepresented in medicine

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Address correspondence to Kimberly Montez, MD, MPH, Department of Pediatrics, Wake Forest Baptist Medical Center, One Medical Center Blvd, Winston-Salem, NC 27157. E-mail: [kmontez@wakehealth.edu](mailto:kmontez@wakehealth.edu)

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## REFERENCES

1. Flores G; Committee On Pediatric Research. Technical report—racial and ethnic disparities in the health and health care of children. *Pediatrics*. 2010;125(4):e979–e1020
2. Vespa J, Medina L, Armstrong DM. *Demographic Turning Points for United States: Population Projections for 2020 to 2060*. Washington, DC: US Census Bureau; 2020
3. Association of American Medical Colleges. Table 12. Practice specialty, females by race/ethnicity, 2018. Diversity in medicine: facts and figures 2019. 2018. Available at: <https://www.aamc.org/data-reports/workforce/data/table-12-practice-specialty-females-race-ethnicity-2018>. Accessed January 2, 2021
4. Association of American Medical Colleges. Table 13. Practice specialty, males by race/ethnicity, 2018. Diversity in medicine: facts and figures 2019. 2018. Available at: <https://www.aamc.org/data-reports/workforce/data/table-13-practice-specialty-males-race-ethnicity-2018>. Accessed January 2, 2021
5. Greenwood BN, Hardeman RR, Huang L, Sojourner A. Physician-patient racial concordance and disparities in birthing mortality for newborns. *Proc Natl Acad Sci U S A*. 2020;117(35):21194–21200
6. Thornton RL, Powe NR, Roter D, Cooper LA. Patient-physician social concordance, medical visit communication and patients' perceptions of health care quality. *Patient Educ Couns*. 2011;85(3):e201–e208
7. Saha S, Komaromy M, Koepsell TD, Bindman AB. Patient-physician racial concordance and the perceived quality and use of health care. *Arch Intern Med*. 1999;159(9):997–1004
8. Shen MJ, Peterson EB, Costas-Muñiz R, et al. The effects of race and racial concordance on patient-physician communication: a systematic review of the literature. *J Racial Ethn Health Disparities*. 2018;5(1):117–140
9. Traylor AH, Schmittiel JA, Uratsu CS, Mangione CM, Subramanian U. Adherence to cardiovascular disease medications: does patient-provider race/ethnicity and language concordance matter? *J Gen Intern Med*. 2010;25(11):1172–1177
10. Komaromy M, Grumbach K, Drake M, et al. The role of black and Hispanic physicians in providing health care for underserved populations. *N Engl J Med*. 1996;334(20):1305–1310
11. Marrast LM, Zallman L, Woolhandler S, Bor DH, McCormick D. Minority physicians' role in the care of underserved patients: diversifying the physician workforce may be key in addressing health disparities. *JAMA Intern Med*. 2014;174(2):289–291
12. Brotherton SE, Stoddard JJ, Tang SS. Minority and nonminority pediatricians' care of minority and poor children. *Arch Pediatr Adolesc Med*. 2000;154(9):912–917
13. Basco WT Jr, Cull WL, O'Connor KG, Shipman SA. Assessing trends in practice demographics of underrepresented minority pediatricians, 1993–2007. *Pediatrics*. 2010;125(3):460–467
14. Cohen JJ, Gabriel BA, Terrell C. The case for diversity in the health care workforce. *Health Aff (Millwood)*. 2002;21(5):90–102
15. Fryer CS, Passmore SR, Maietta RC, et al. The symbolic value and limitations of racial concordance in minority research engagement. *Qual Health Res*. 2016;26(6):830–841
16. Acosta DA. Achieving excellence through equity, diversity and inclusion. Insights diversity and inclusion. 2020. Available at: <https://www.aamc.org/news-insights/achieving-excellence-through-equity-diversity-and-inclusion>. Accessed January 2, 2021
17. Committee on Pediatric Workforce. Enhancing pediatric workforce diversity and providing culturally effective pediatric care: implications for practice, education, and policy making. *Pediatrics*. 2013;132(4). Available at: [www.pediatrics.org/cgi/content/full/132/4/e1105](http://www.pediatrics.org/cgi/content/full/132/4/e1105)
18. Liaison Committee on Medical Education. Consensus statement related to satisfaction with element 3.3, diversity/pipeline programs and partnerships. 2015. Available at: <https://lme.org/wp-content/uploads/filebase/>

- white\_papers/lcme-consensus-statement-with-intro-element3-3.doc. Accessed January 14, 2021
19. Accreditation Council for Graduate Medical Education. Diversity, equity and inclusion. 2019. Available at: <https://www.acgme.org/What-We-Do/Diversity-Equity-and-Inclusion>. Accessed January 14, 2021
20. Aibana O, Swails JL, Flores RJ, Love L. Bridging the gap: holistic review to increase diversity in graduate medical education. *Acad Med*. 2019;94(8):1137–1141
21. Nakae S, Porfeli EJ, Davis D, et al. Enrollment management in undergraduate medical school admissions: a complementary framework to holistic review for increasing diversity in medicine. *Acad Med*. 2021;96(4):501–506
22. Association of American Medical Colleges. Figure 2. Percentage of applicants to U.S. medical schools by race/ethnicity (alone), academic year 2018-2019. Diversity in medicine: facts and figures 2019. 2019. Available at: <https://www.aamc.org/data-reports/workforce/interactive-data/figure-2-percentage-applicants-us-medical-schools-race/ethnicity-alone-academic-year-2018-2019>. Accessed January 2, 2021
23. Association of American Medical Colleges. Figure 8. Percentage of matriculants to U.S. medical schools by race/ethnicity (alone), academic year 2018-2019. Diversity in medicine: facts and figures 2019. 2019. Available at: <https://www.aamc.org/data-reports/workforce/interactive-data/figure-8-percentage-matriculants-us-medical-schools-race/ethnicity-alone-academic-year-2018-2019>. Accessed January 2, 2021
24. Lett LA, Murdock HM, Orji WU, Aysola J, Sebro R. Trends in racial/ethnic representation among US medical students. *JAMA Netw Open*. 2019;2(9):e1910490
25. Santhosh L, Babik JM. Trends in racial and ethnic diversity in internal medicine subspecialty fellowships from 2006 to 2018. *JAMA Netw Open*. 2020;3(2):e1920482
26. Shantharam G, Tran TY, McGee H, Thavaseelan S. Examining trends in underrepresented minorities in urology residency. *Urology*. 2019;127:36–41
27. Orr CJ, Ritter V, Turner L, et al. Membership trends in the academic pediatric association from 2009 to 2018. *Acad Pediatr*. 2020;20(6):816–822
28. Lett LA, Orji WU, Sebro R. Declining racial and ethnic representation in clinical academic medicine: a longitudinal study of 16 US medical specialties. *PLoS One*. 2018;13(11):e0207274
29. Association of American Medical Colleges. Medical minority applicant registry (MedMAR). Available at: <https://students-residents.aamc.org/choosing-medical-career/article/medical-minority-applicant-registry-med-mar>. Accessed March 6, 2020
30. Brotherton SE, Etzel SI. Graduate medical education, 2006-2007. *JAMA*. 2007;298(9):1081–1096
31. Brotherton SE, Etzel SI. Graduate medical education, 2007-2008. *JAMA*. 2008;300(10):1228–1243
32. Brotherton SE, Etzel SI. Graduate medical education, 2008-2009. *JAMA*. 2009;302(12):1357–1372
33. Brotherton SE, Etzel SI. Graduate medical education, 2009-2010. *JAMA*. 2010;304(11):1255–1270
34. Brotherton SE, Etzel SI. Graduate medical education, 2010-2011. *JAMA*. 2011;306(9):1015–1030
35. Brotherton SE, Etzel SI. Graduate medical education, 2011-2012. *JAMA*. 2012;308(21):2264–2279
36. Brotherton SE, Etzel SI. Graduate medical education, 2012-2013. *JAMA*. 2013;310(21):2328–2346
37. Brotherton SE, Etzel SI. Graduate medical education, 2013-2014. *JAMA*. 2014;312(22):2427–2445
38. Brotherton SE, Etzel SI. Graduate medical education, 2014-2015. *JAMA*. 2015;314(22):2436–2454
39. Brotherton SE, Etzel SI. Graduate medical education, 2015-2016. *JAMA*. 2016;316(21):2291–2310
40. Brotherton SE, Etzel SI. Graduate medical education, 2016-2017. *JAMA*. 2017;318(23):2368–2387
41. Brotherton SE, Etzel SI. Graduate medical education, 2017-2018. *JAMA*. 2018;320(10):1051–1070
42. Brotherton SE, Etzel SI. Graduate medical education, 2018-2019. *JAMA*. 2019;322(10):996–1016
43. United States Census Bureau. QuickFacts United States. 2019. Available at: <https://www.census.gov/quickfacts/fact/table/US/SEX255218>. Accessed March 10, 2020
44. Kaiser Family Foundation. Population distribution by race/ethnicity. 2019. Available at: <https://www.kff.org/other/state-indicator/distribution-by-raceethnicity/>. Accessed January 2, 2021
45. Flores RL, Halsall J. The rising gap between rich and poor: a look at the persistence of educational disparities in the United States and why we should worry. *Cogent Soc Sci*. 2017;3(1):1323698
46. Darling-Hammond L. *Inequality in Teaching and Schooling: How Opportunity is Rationed to Students of Color in America*. Washington, DC: Institute of Medicine; 2001
47. Kotok S, Frankenberg E, Schafft KA, Mann BA, Fuller EJ. School choice, racial segregation, and poverty concentration: evidence from Pennsylvania charter school transfers. *Educ Policy*. 2015;31(4):415–447
48. Cohen JJ. The consequences of premature abandonment of affirmative action in medical school admissions. *JAMA*. 2003;289(9):1143–1149
49. Long MC, Bateman NA. Long-run changes in underrepresentation after affirmative action bans in public universities. *Educ Eval Policy Anal*. 2020;42(2):188–207
50. Howard Nichols A. *Segregation Forever?: The Continued Underrepresentation of Black and Latino Undergraduates at the Nation's 101 Most Selective Public Colleges and Universities*. Washington, DC: The Education Trust; 2020
51. Association of American Medical Colleges. *Altering the Course: Black Males in Medicine*. Washington, DC: AAMC; 2015
52. Association of American Medical Colleges. Table B-3: total U.S. medical school enrollment by race/ethnicity (alone) and sex, 2016-2017 through 2020-2021. 2020. Available at: [aamc.org/media/6116/download](https://aamc.org/media/6116/download). Accessed January 16, 2021



53. Capers Q IV, Clinchot D, McDougale L, Greenwald AG. Implicit racial bias in medical school admissions. *Acad Med*. 2017;92(3):365–369
54. Jones AC, Nichols AC, McNicholas CM, Stanford FC. Admissions is not enough: the racial achievement gap in medical education. *Acad Med*. 2021;96(2):176–181
55. Teherani A, Hauer KE, Fernandez A, King TE Jr, Lucey C. How small differences in assessed clinical performance amplify to large differences in grades and awards: a cascade with serious consequences for students underrepresented in medicine. *Acad Med*. 2018;93(9):1286–1292
56. Low D, Pollack SW, Liao ZC, et al. Racial/ethnic disparities in clinical grading in medical school. *Teach Learn Med*. 2019;31(5):487–496
57. Boatright D, Ross D, O'Connor P, Moore E, Nunez-Smith M. Racial disparities in medical student membership in the alpha omega alpha honor society. *JAMA Intern Med*. 2017;177(5):659–665
58. Orom H, Semalulu T, Underwood W III. The social and learning environments experienced by underrepresented minority medical students: a narrative review. *Acad Med*. 2013;88(11):1765–1777
59. Weyand AC, Nichols DG, Freed GL. Current efforts in diversity for pediatric subspecialty fellows: playing a zero-sum game. *Pediatrics*. 2020;146(5):e2020001248
60. Dixon G, Kind T, Wright J, Stewart N, Sims A, Barber A. Factors that influence underrepresented in medicine (UIM) medical students to pursue a career in academic pediatrics. *J Natl Med Assoc*. 2021;113(1):95–101
61. Nunez-Smith M, Pilgrim N, Wynia M, et al. Health care workplace discrimination and physician turnover. *J Natl Med Assoc*. 2009;101(12):1274–1282
62. Osseo-Asare A, Balasuriya L, Huot SJ, et al. Minority resident physicians' views on the role of race/ethnicity in their training experiences in the workplace. *JAMA Netw Open*. 2018;1(5):e182723
63. Lu DW, Hartman ND, Druck J, Mitzman J, Strout TD. Why residents quit: national rates of and reasons for attrition among emergency medicine physicians in training. *West J Emerg Med*. 2019;20(2):351–356
64. McAlister RP, Andriole DA, Brotherton SE, Jeffe DB. Attrition in residents entering US obstetrics and gynecology residencies: analysis of National GME Census data. *Am J Obstet Gynecol*. 2008;199(5):574.e1–574.e6
65. Umoren RA, Frintner MP. Do mentors matter in graduating pediatrics residents' career choices? *Acad Pediatr*. 2014;14(4):348–352
66. Frintner MP, Mulvey HJ, Pletcher BA, Olson LM. Pediatric resident debt and career intentions. *Pediatrics*. 2013;131(2):312–318
67. Jolly P. Medical school tuition and young physicians' indebtedness. *Health Aff (Millwood)*. 2005;24(2):527–535
68. Dixon G, Kind T, Wright J, Stewart N, Sims A, Barber A. Factors that influence the choice of academic pediatrics by underrepresented minorities. *Pediatrics*. 2019;144(2):e20182759
69. Johnson TJ, Ellison AM, Dalember G, et al. Implicit bias in pediatric academic medicine. *J Natl Med Assoc*. 2017;109(3):156–163
70. Raphael JL, Giardino AP, Harris T, Tran XG, Yoon J, Phillips JL. Perceptions revisited: pediatric chief resident views on minority housestaff recruitment and retention in pediatric residency programs. *J Natl Med Assoc*. 2014;106(1):58–68
71. Doucet H, Shah MK, Cummings TL, Kahn MJ. Comparison of internal medicine, pediatric, and medicine/pediatrics applicants and factors influencing career choices. *South Med J*. 1999;92(3):296–299
72. Palepu A, Carr PL, Friedman RH, Ash AS, Moskowitz MA. Specialty choices, compensation, and career satisfaction of underrepresented minority faculty in academic medicine. *Acad Med*. 2000;75(2):157–160
73. Perlman M. The origin of the term 'intersectionality'. *Columbia Journalism Review*. October 23, 2018. Available at: [https://www.cjr.org/language\\_corner/intersectionality.php](https://www.cjr.org/language_corner/intersectionality.php). Accessed January 3, 2021
74. Lautenberger DM, Dandar VM. *The State of Women in Academic Medicine: Exploring Pathways to Equity, 2018-2019*. Washington, DC: Association of American Medical Colleges; 2020
75. Wilson Y, White A, Jefferson A, Danis M. Intersectionality in clinical medicine: the need for a conceptual framework. *Am J Bioeth*. 2019;19(2):8–19
76. Spector ND, Asante PA, Marcelin JR, et al. Women in pediatrics: progress, barriers, and opportunities for equity, diversity, and inclusion. *Pediatrics*. 2019;144(5):e20192149
77. Ginther DK, Kahn S, Schaffer WT. Gender, race/ethnicity, and National Institutes of Health R01 research awards: is there evidence of a double bind for women of color? *Acad Med*. 2016;91(8):1098–1107
78. Association of American Medical Colleges. *Diversity and Inclusion in Academic Medicine: A Strategic Planning Guide*. Washington, DC: Association of American Medical Colleges; 2016
79. Baugh AD, Vanderbilt AA, Baugh RF. The dynamics of poverty, educational attainment, and the children of the disadvantaged entering medical school. *Adv Med Educ Pract*. 2019;10:667–676
80. Association of American Medical Colleges. Figure 10. Amount of premedical education debt for U.S. medical school matriculants by race/ethnicity, academic year 2018-2019. Diversity in medicine: facts and figures 2019. 2019. Available at: <https://www.aamc.org/data-reports/workforce/interactive-data/figure-10-amount-premedical-education-debt-us-medical-school-matriculants-race/ethnicity-academic>. Accessed January 3, 2020
81. Mendoza FS, Walker LR, Stoll BJ, et al. Diversity and inclusion training in pediatric departments. *Pediatrics*. 2015;135(4):707–713
82. Schmidt BJ, MacWilliams BR. Evaluating an accelerated nursing program: a dashboard for diversity. *J Prof Nurs*. 2015;31(2):82–88
83. Tufts University. Diversity and inclusion. 2019. Available at: <https://www.tufts.edu/strategic-themes/diversity-and-inclusion>. Accessed January 3, 2021
84. Flores G, Mendoza FS, DeBaun MR, et al. Keys to academic success for underrepresented minority young investigators: recommendations from the Research in Academic Pediatrics Initiative on

Diversity (RAPID) National Advisory Committee. *Int J Equity Health*. 2019;18(1):93

85. Pachter LM, Kodjo C. New century scholars: a mentorship program to increase

workforce diversity in academic pediatrics. *Acad Med*. 2015;90(7):881–887